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EFFECT OF PRE-HYPERTENSION ON ENDOTHELIAL FUNCTION AND INTIMA MEDIA THICKNESS OF THE CAROTID ARTERY IN AFRICAN AMERICANS

ACC Poster Contributions
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Background: Pre-hypertension (pre-HTN) is a precursor of clinical hypertension, and is associated with increased cardiovascular mortality. Pre-HTN and HTN are more prevalent in African Americans (AA). We investigated whether endothelial function, which is a key element for early prediction of cardiovascular disease, is decreased and intima media thickness of the common carotid artery is increased in AA with pre-HTN.

Methods: Fifty one AA patients with pre-HTN (JNC 7- BP 120/80 - 139/89 mmHg) were enrolled. We assessed endothelium-dependent and independent, flow-mediated dilation (FMD) of the forearm brachial artery using high-resolution ultrasound. We examined the IMT of the both common carotid arteries at the same intervention.

Results: Baseline demographics were: age 52 ± 7 years, 86% female, SBP- 125 ± 16 and DBP- 80 ± 11 mmHg, BMI 33 ± 5 kg/m2, HR 76 ± 11 bpm, total cholesterol- 195 ± 26 and LDL- 115 ± 33 mg/dL. Endothelium dependent FMD changes were reduced to 6.3 ± 2.1% ($p<0.05$ when compared to our control data from healthy volunteer). Regression analysis showed correlation of FMD changes with SBP>120 mmHg and BMI ($p=0.044$). There were no significant differences at 4-min post-nitroglycerine (NTG) FMD changes. 4-min NTG FMD changes correlated with age ($p=0.042$), SBP ($p=0.084$), and HR ($p=0.099$). Gender, ethnicity, total cholesterol, and LDL had no correlation with FMD changes. IMT of the both carotid arteries showed mildly elevated thickness in pre-hypertensive AA (RCCA - 0.56 ± 0.16 and LCCA- 0.57 ± 0.11 mm). IMT changes correlated with age, BMI, and LDL ($p<0.05$).

Conclusions: African Americans with pre-HTN have demonstrated reduced endothelial function with increased intima media thickness of the carotid artery. These findings indicate a higher risk for future cardiovascular events in AA. Early intervention and aggressive life style modification to reduce BMI and other risk factors may improve endothelial function, and decrease IMT leading to decreased cardiovascular events.